WHAT IS CLAIMED IS:

1. A method for preparing a mPEG-maleimide polymer compound, said method comprising:

reacting an mPEG-maleamic acid derivative in the presence of base, organic solvent and pentafluorophenyl trifluoroacetate, wherein said mPEG-maleamic acid derivative is represented by general formula (I-a)

$$mPEG\text{-}OCH_2CH_2\text{-}NHCOCH{=}CHCO_2H \quad \text{(I-a)},$$

thereby forming an mPEG-maleimide polymer compound.

2. The method of Claim 1, wherein said base is diisopropylethylamine (DIEA) or diethyleneamine (DEA).

3. The method of Claim 1, wherein said organic solvent is the solvent mixture of dichloromethane and dimethylformamide (DMF).

4. The method of claim 3, wherein said solvent mixture of dichloromethane and DMF is in a mix ratio of 4:1.

5. The method of Claim 1, wherein said PEG polymer has a molecular weight ranging from about 100 to 1,000,000 Daltons.

6. The method of Claim 1, wherein and said PEG polymer has a molecular weight ranging from about 1,000 to 100,000 Daltons.

7. A method for preparing a PEG-$(maleimide)_2$ polymer compound, said method comprising:

reacting a PEG-maleamic acid derivative in the presence of base, organic solvent and pentafluorophenyl trifluoroacetate, wherein said PEG-maleamic acid derivative is represented by general formula (II-a)

$$HO_2CCH{=}CHCONH\text{-}PEG\text{-}OCH_2CH_2\text{-}NHCOCH{=}CHCO_2H \quad \text{(II-a)},$$

thereby forming a PEG-$(maleimide)_2$ polymer compound.

8. The method of Claim 7, wherein said base is diisopropylethylamine (DIEA) or diethyleneamine (DEA).

9. The method of Claim 7, wherein said organic solvent is the solvent mixture of dichloromethane and dimethylformamide (DMF).

10. The method of claim 9, wherein said solvent mixture of dichloromethane and DMF is in a mix ratio of 4:1.

11. The method of Claim 7, wherein said PEG polymer has a molecular weight ranging from about 100 to 1,000,000 Daltons.

12. The method of Claim 7, wherein and said PEG polymer has a molecular weight ranging from about 1,000 to 100,000 Daltons.

13. A method of preparing a multi-arm PEG-maleimide polymer compound, said method comprising:

reacting a multi-arm PEG-maleamic acid derivative in the presence of base, organic solvent and pentafluorophenyl trifluoroacetate, wherein said multi-arm PEG-maleamic acid derivative is represented by general formula (III-a)

$$R(\text{—PEG—}OCH_2CH_2\text{-NHCOCH=CHCO}_2H)_n \quad \text{(III-a)},$$

wherein R is central core, n is an integer from 3 to 12 which indicates the number of arms,

thereby forming a multi-arm PEG-maleimide polymer compound.

14. The method of Claim 13, wherein said perfluorocarbon is pentafluorophenyl trifluoroacetate.

15. The method of Claim 13, wherein said base is diisopropylethylamine (DIEA) or diethyleneamine (DEA).

16. The method of Claim 13, wherein said organic solvent is the solvent mixture of dichloromethane and dimethylformamide (DMF).

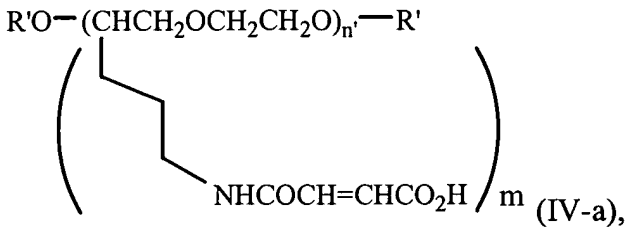
17. The method of claim 16, wherein said solvent mixture of dichloromethane and DMF is in a mix ratio of 4:1.

18. The method of Claim 13, wherein said PEG polymer has a molecular weight ranging from about 100 to 1,000,000 Daltons.

19. The method of Claim 13, wherein and said PEG polymer has a molecular weight ranging from about 1,000 to 100,000 Daltons.

20. A method of preparing a pendant-type multi-arm PEG-maleimide polymer compound, said method comprising:

reacting a pendant-type multi-arm PEG-maleamic acid derivative in the presence of base, organic solvent and pentafluorophenyl trifluoroacetate, wherein said pendant-type multi-arm PEG-maleamic acid derivative is represented by general formula (III-a)



(IV-a),

wherein R' is a hydrogen atom or a lower alkyl group having 1 to 3 carbon, n' is an integer of 3 to 3000, m is an integer of 1 to 20 which represents the number of arms,

thereby forming a pendant-type multi-arm PEG-maleimide polymer compound.

21. The method of Claim 20, wherein said base is diisopropylethylamine (DIEA) or diethyleneamine (DEA).

22. The method of Claim 20, wherein said organic solvent is the solvent mixture of dichloromethane and dimethylformamide (DMF).

23. The method of claim 22, wherein said solvent mixture of dichloromethane and DMF is in a mix ratio of 4:1.

24. The method of Claim 20, wherein said PEG polymer has a molecular weight ranging from about 100 to 1,000,000 Daltons.

25. The method of Claim 20, wherein and said PEG polymer has a molecular weight ranging from about 1,000 to 100,000 Daltons.